

THAT WHICH IS CLAIMED:

1. An apparatus for automatically generating a terrain model for display during a simulated flight along a predefined mission route, the apparatus comprising:

a mission profiler for automatically determining an area containing the mission route for which terrain source data is required;

a search engine for automatically searching a plurality of electronic collections of terrain source data to identify terrain source data covering the area containing the mission route;

an image engine for processing terrain source data into one or more predefined formats; and

a terrain engine for automatically compiling the processed data to create a terrain model for display during flight simulation.

2. An apparatus according to Claim 1 wherein said mission profiler comprises an input for receiving data at least partially defining a mission route.

3. An apparatus according to Claim 2 wherein said mission profiler comprises a processing element for automatically dividing the area into a plurality of regions based upon the mission route and determining a respective resolution of the terrain source data for each region.

4. An apparatus according to Claim 3 wherein said input also receives data defining at least one of an aircraft platform and a simulator platform, and wherein said processing element determines the area and the respective resolution of regions within the area based at least partially upon at least one of the aircraft platform and the simulator platform.

5. An apparatus according to Claim 3 wherein said input receives data defining a plurality of different types of points along the mission route, and wherein said processing element determines the area and the respective resolution of regions within the area based at least partially upon the different types of points along the mission route.

6. An apparatus according to Claim 3 wherein said processing element is capable of determining the area and the respective resolution of regions within

the area based upon predefined criteria, and wherein said input is adapted to receive adjustments to at least some of the predefined criteria such that said processing element determines the area and the respective resolution of regions within the area based upon the adjusted criteria.

5           7.       An apparatus according to Claim 1 further comprising a memory device for storing the terrain source data covering the area containing the mission route identified by the search engine to facilitate display during flight simulation.

8.       An apparatus according to Claim 7 wherein said memory device stores terrain source data from prior mission routes.

10          9.       An apparatus according to Claim 8 wherein said search engine compares terrain source data obtained from an electronic collection of terrain source data with terrain source data from prior mission routes to determine the terrain source data that is most acceptable for the flight simulation of the mission route.

15          10.       An apparatus according to Claim 9 wherein said search engine obtains information representative of the terrain source data that is obtainable from the electronic collection of terrain source data, wherein said search engine obtains the terrain source data from the electronic collection of terrain source data that is more acceptable for the flight simulation of the mission route than terrain source data from prior mission routes, and wherein said memory device stores the terrain source data obtained from the electronic collection.

20          11.       An apparatus according to Claim 10 wherein said memory device comprises:

25           a first memory device for storing the information representative of the terrain source data; and

          a second memory device for storing the terrain source data.

30          12.       An apparatus according to Claim 1 wherein said image engine automatically generates processed terrain data having one of the predefined formats and at least one of a corrected elevation model, a material map, vector data and a feature model.

13. An apparatus according to Claim 1 wherein said terrain engine comprises a data importer for receiving the processed data for an area containing a mission route, said data importer also receiving project source data defining geospecific properties for the area containing the mission route.

5 14. An apparatus according to Claim 13 wherein said terrain engine further comprises a terrain compiler for automatically creating the terrain model for display during flight simulation based upon a combination of both the processed data and the project source data.

10 15. An apparatus according to Claim 13 wherein said data importer receives project source data selected from the group consisting of information related to vegetation and information related to cultural features.

16. An apparatus according to Claim 13 wherein said data importer receives processed data from said image engine that is selected from the group consisting of imagery data, elevational data, feature data and mission route data.

15 17. A method for automatically generating a terrain model for display during a simulated flight along a predefined mission route, the method comprising:  
automatically determining an area containing the mission route for which terrain source data is required;  
automatically searching a plurality of electronic collections of terrain  
20 source data to identify terrain source data covering the area containing the mission route;  
processing terrain source data into one or more predefined formats; and  
automatically compiling the processed data to create a terrain model for display during flight simulation.

25 18. A method according to Claim 17 further comprising receiving data at least partially defining a mission route prior to determining the area containing the mission route.

19. A method according to Claim 18 wherein determining the area comprises automatically dividing the area into a plurality of regions based upon the

mission route and determining a respective resolution of the terrain source data for each region.

20. A method according to Claim 19 further comprising receiving data defining at least one of an aircraft platform and a simulator platform, and wherein  
5 determining the area and the respective resolution of regions within the area is based at least partially upon at least one of the aircraft platform and the simulator platform.

21. A method according to Claim 19 further comprising defining a plurality of different types of points along the mission route, and wherein  
10 determining the area and the respective resolution of regions within the area is based at least partially upon the different types of points along the mission route.

22. A method according to Claim 19 wherein determining the area and the respective resolution of regions within the area is based upon predefined criteria, and wherein the method further comprises receiving adjustments to at least  
15 some of the predefined criteria such that the area and the respective resolution of regions within the area are based upon the adjusted criteria.

23. A method according to Claim 17 further comprising storing the terrain source data covering the area containing the mission route identified by the search engine to facilitate display during flight simulation.

20 24. A method according to Claim 23 wherein storing the terrain source data comprises storing terrain source data from prior mission routes.

25 25. A method according to Claim 24 wherein automatically searching the electronic collections of terrain source data comprises comparing terrain source data obtained from an electronic collection of terrain source data with terrain source data from prior mission routes to determine the terrain source data that is most acceptable for the flight simulation of the mission route.

26. A method according to Claim 25 wherein automatically searching the electronic collections of terrain source data further comprises obtaining information representative of the terrain source data that is obtainable from the

electronic collection of terrain source data and obtaining the terrain source data from the electronic collection of terrain source data that is more acceptable for the flight simulation of the mission route than terrain source data from prior mission routes, and wherein storing the terrain source data comprises storing the terrain source data obtained from the electronic collection.

27. A method according to Claim 17 wherein processing the terrain source data comprises automatically generating processed terrain data having one of the predefined formats and at least one of a corrected elevation model, a material map, vector data and a feature model.

28. A method according to Claim 17 wherein automatically compiling the processed data comprises receiving both the processed data for an area containing a mission route and project source data defining geospecific properties for the area containing the mission route.

29. A method according to Claim 28 wherein automatically compiling the processed data further comprises automatically creating the terrain model for display during flight simulation based upon a combination of both the processed data and the project source data.

30. A method according to Claim 28 wherein receiving project source data comprises receiving project source data selected from the group consisting of information related to vegetation and information related to cultural features.

31. A method according to Claim 28 wherein receiving processed data comprises receiving processed data selected from the group consisting of imagery data, elevational data, feature data and mission route data.

32. An automated flight simulation mission profiler comprising:  
an input for receiving data at least partially defining a mission route; and  
a processing element for automatically determining an area containing the mission route for which terrain source data is required, said processing element also automatically dividing the area into a plurality of regions based upon the mission route and determining a respective resolution of the terrain source data for each region.

33. An automated flight simulation mission profiler according to Claim 32 wherein said input also receives data defining at least one of an aircraft platform and a simulator platform, and wherein said processing element determines the area and the respective resolution of regions within the area based at least partially upon  
5 at least one of the aircraft platform and the simulator platform.

34. An automated flight simulation mission profiler according to Claim 32 wherein said input receives data defining a plurality of different types of points along the mission route, and wherein said processing element determines the area and the respective resolution of regions within the area based at least partially upon  
10 the different types of points along the mission route.

35. An automated flight simulation mission profiler according to Claim 32 wherein said processing element is capable of determining the area and the respective resolution of regions within the area based upon predefined criteria, and wherein said input is adapted to receive adjustments to at least some of the  
15 predefined criteria such that said processing element determines the area and the respective resolution of regions within the area based upon the adjusted criteria.

36. An automated method for determining a flight simulation mission profile comprising:  
receiving data at least partially defining a mission route;  
20 automatically determining an area containing the mission route for which terrain source data is required; and  
automatically dividing the area into a plurality of regions based upon the mission route and determining a respective resolution of the terrain source data for each region.

37. A method according to Claim 36 further comprising receiving data defining at least one of an aircraft platform and a simulator platform, and wherein automatically determining the area and the respective resolution of regions within the area is based at least partially upon at least one of the aircraft platform and the simulator platform.

38. A method according to Claim 36 further comprising receiving data defining a plurality of different types of points along the mission route, and

wherein automatically determining the area and the respective resolution of regions within the area is based at least partially upon the different types of points along the mission route.

39. A method according to Claim 36 wherein automatically determining the area and the respective resolution of regions within the area is based upon predefined criteria, and wherein the method further comprises receiving adjustments to at least some of the predefined criteria such that the area and the respective resolution of regions within the area are determined based upon the adjusted criteria.

40. An apparatus for automatically collecting terrain source data for display during flight simulation, the apparatus comprising:  
an input for receiving data defining an area containing a mission route for which terrain source data is required;  
a search engine for automatically searching a plurality of electronic collections of terrain source data to identify terrain source data covering the area containing the mission route; and  
a memory device for storing the terrain source data covering the area containing the mission route identified by the search engine to facilitate display during flight simulation.

41. An apparatus according to Claim 40 wherein said memory device stores terrain source data from prior mission routes.

42. An apparatus according to Claim 41 wherein said search engine compares terrain source data obtained from an electronic collection of terrain source data with terrain source data from prior mission routes to determine the terrain source data that is most acceptable for the flight simulation of the mission route.

43. An apparatus according to Claim 42 wherein said search engine obtains information representative of the terrain source data that is obtainable from the electronic collection of terrain source data, wherein said search engine obtains the terrain source data from the electronic collection of terrain source data that is more acceptable for the flight simulation of the mission route than terrain source

data from prior mission routes, and wherein said memory device stores the terrain source data obtained from the electronic collection.

44. An apparatus according to Claim 43 wherein said memory device comprises:

- 5           a first memory device for storing the information representative of the terrain source data; and
- a second memory device for storing the terrain source data.

45. A method for automatically collecting terrain source data for display during flight simulation, the method comprising:

10           receiving data defining an area containing a mission route for which terrain source data is required;

            automatically searching a plurality of electronic collections of terrain source data to identify terrain source data covering the area containing the mission route; and

15           storing the terrain source data covering the area containing the mission route identified by the search engine to facilitate display during flight simulation.

46. A method according to Claim 45 wherein storing the terrain source data comprises storing terrain source data from prior mission routes.

20           47. A method according to Claim 46 wherein automatically searching the plurality of electronic collections of terrain source data comprises comparing terrain source data obtained from an electronic collection of terrain source data with terrain source data from prior mission routes to determine the terrain source data that is most acceptable for the flight simulation of the mission route.

25           48. A method according to Claim 47 wherein automatically searching the plurality of electronic collections of terrain source data further comprises obtaining information representative of the terrain source data that is obtainable from the electronic collection of terrain source data, and obtaining the terrain source data from the electronic collection of terrain source data that is more

30           acceptable for the flight simulation of the mission route than terrain source data



from prior mission routes, and wherein storing the terrain source data comprises storing the terrain source data obtained from the electronic collection.

49. A terrain engine for automatically compiling terrain source data to create a terrain model for display during flight simulation, the terrain engine comprising:

a data importer for receiving the terrain source data for an area containing a mission route, said data importer also receiving project source data defining geospecific properties for the area containing the mission route; and

a terrain compiler for automatically creating the terrain model for display during flight simulation based upon a combination of both the terrain source data and the project source data.

50. A terrain engine according to Claim 49 wherein said data importer receives project source data selected from the group consisting of information related to vegetation and information related to cultural features.

51. A terrain engine according to Claim 49 wherein said data importer receives terrain source data selected from the group consisting of imagery data, elevational data, feature data and mission route data.

52. A method for automatically compiling terrain source data to create a terrain model for display during flight simulation, the method comprising:

receiving the terrain source data for an area containing a mission route;

receiving project source data defining geospecific properties for the area containing the mission route; and

automatically creating the terrain model for display during flight simulation based upon a combination of both the terrain source data and the project source data.

53. A method according to Claim 52 wherein receiving the project source data comprises receiving project source data selected from the group consisting of information related to vegetation and information related to cultural features.

54. A method according to Claim 52 wherein receiving the terrain source data comprises receiving terrain source data selected from the group consisting of imagery data, elevational data, feature data and mission route data.